

WHAT IS CLAIMED IS:

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1. A charged particle illumination system component, comprising:
a lens array configured to be placed in said charged particle illumination system component.
 - 5 2. The charged particle illumination system component of claim 1, wherein said lens array is placed in a drift space of said charged particle illumination system component.
 3. The illumination system component of claim 1, wherein said illumination system component is an electron gun.
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 4. The illumination system component of claim 1, wherein said illumination system component is a liner tube, connectable to an electron gun.
 5. The illumination system component of claim 4, wherein the liner tube and the electron gun are secured vacuum-tight.
 6. The illumination system component of claim 4, wherein the liner tube and the electron gun are bolted together.
 7. The illumination system component of claim 4, wherein the liner tube and the electron gun are welded together.
 8. The illumination system component of claim 1, said lens array including at least one mesh grid.
 9. The illumination system component of claim 1, said lens array including at least two mesh grids.
 10. The illumination system component of claim 1, said lens array including at least three mesh grids.
 11. The illumination system component of claim 8, said lens array further including at least one continuous foil.

12. The illumination system component of claim 9, said lens array further including at least one continuous foil.

13. The illumination system component of claim 1, said lens array having a transparency between 40-90%.

14. A method of controlling beam emittance, comprising:
placing a lens array in a charged particle illumination system component.

15. The method of claim 14, wherein the lens array is placed in a drift space of the charged particle illumination system component.

16. The method of claim 14, wherein the illumination system component is an electron gun.

17. The method of claim 14, wherein the illumination system component is a liner tube, connectable to an electron gun.

18. The method of claim 14, wherein the liner tube and the electron gun are secured vacuum-tight.

19. The method of claim 14, wherein the lens array including at least one mesh grid.

20. The method of claim 14, wherein the lens array including at least two mesh grids.

21. The method of claim 14, wherein the lens array including at least three mesh grids.

22. The method of claim 19, wherein the lens array further includes at least one continuous foil.

23. The method of claim 20, wherein the lens array further includes at least one continuous foil.

24. The method of claim 14, wherein the lens array has a transparency between 40-90%.

sub a5 } 25. An electron beam exposure tool comprising:
a charged particle illumination system component including a lens array placed in said charged particle illumination system component.

26. The electron beam exposure tool of claim 25, wherein said lens array is placed in a drift space of said charged particle illumination system component.

27. The electron beam exposure tool of claim 25, wherein said electron beam exposure tool is a SCALPEL tool, modified electron beam exposure system (MEBES) tool, or EBES tool.

28. The electron beam exposure tool of claim 25, wherein said illumination system component is an electron gun.

sub a5 } 29. The electron beam exposure tool of claim 25, wherein said illumination system component is a liner tube, connectable to an electron gun.

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